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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,127	07/29/2003	Chris E. Barns	ITL.1016US (P16703)	5928

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HOUSTON, TX 77024

EXAMINER

DUONG, KHANH B

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 03/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,127

Applicant(s)

BARNES ET AL.

Examiner

Khanh B. Duong

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 16-24 is/are pending in the application.
- 4a) Of the above claim(s) 20-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 16-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 17, 2005 has been entered.

Accordingly, claim 15 was cancelled, and claims 1 and 16-19 were amended.

Claims 20-24 remain withdrawn from consideration as being directed to a non-elected invention.

Currently, claims 1-14 and 16-19 are active.

Specification

The disclosure is objected to because of the following informalities:

page 6, line 20, "dielectric 12" should be --dielectric 19--; and

page 7, line 1, "dielectric 12" should be --dielectric 19--.

Appropriate correction is required.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "20". Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement

drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the step of "forming a silicide on a second polysilicon gate structure" (claim 14, line 4) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 2 is objected to because of the following informalities: line 1, "a polysilicon gate structure" should be --the polysilicon gate structure--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 and 5-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (U.S. Patent No. 6,800,530).

Re claims 1-3, Lee et al. ("Lee") discloses in FIG. 1 to 8 a method comprising: covering a polysilicon gate structure 30 with a nitride hard mask 52, said mask 50 and said gate structure 30 having opposed, common vertical surfaces; and forming a sidewall spacer 124 that extends along a vertical surface and covers said gate structure 30 and covers at least part of said mask 50.

Re claims 5-8, Lee expressly discloses in FIG. 7 to 8 the mask 52 is removed after forming a silicide 137 by etching and/or polishing [see col. 4, ln. 13-20].

Re claim 9, Lee discloses in FIG. 8 replacing the polysilicon gate structure 30 with a metal gate 133 replacement.

Re claim 10, Lee discloses in FIG. 2 forming the polysilicon gate structure including a patterned polysilicon portion 30 and underlying dielectric layer 20.

Re claim 12, Lee discloses in FIG. 3 forming the spacers 124 on either side of the polysilicon gate structure.

Re further claims 1-3, 11 and 12, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed ("to prevent the formation of a silicide on the gate structure", "protecting the polysilicon gate structure", etc.) does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F. 2d 1647 (1987).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (U.S. Patent No. 6,800,530) in view of Lee (U.S. Patent No. 6,258,648).

Re claim 4, Lee '530 fails to disclose forming the mask on at least one polysilicon gate structure 10 and removing the mask 26 over another gate structure to form a silicide on the another gate structure.

Lee '648 suggests in FIG. 2 to 6 forming a mask 26 on at least one polysilicon gate structure 10 and removing the mask 26 over another gate structure 10 to form a silicide 32 on the another gate structure 10.

Since Lee '530 and Lee '648 are from the same field of endeavor, the purpose disclosed by Lee '648 would have been recognized in the pertinent prior art of Lee '530.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee '530 with the suggestion of Lee '648 because of the desirability to selectively form silicide structures.

Furthermore, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed ("selectively protecting at least one polysilicon gate structure with the mask to prevent the formation of a silicide ") does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F. 2d 1647 (1987).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (U.S. Patent No. 6,800,530) in view of Wang et al. (U.S. Patent No. 6,248,002).

Re claim 13, Lee '530 fails to disclose using a two-step polish to remove said mask including a first step using a harder pad and a second step using a softer pad.

Wang et al. ("Wang") expressly suggests in FIG. 6 using a three-step polish including a first step using a harder pad and a second step using a softer pad.

Since Lee '530 and Wang are both from the same field of endeavor, the purpose disclosed by Wang would have been recognized in the pertinent prior art of Lee '530.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee '530 as suggested by Wang, since Wang states in the ABSTRACT that such modification would prevent the accumulation of particle impurities on the surface of a semiconductor substrate that contains wofram plugs during the process of polishing the surface of the wafer.

Claims 14 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (U.S. Patent No. 6,258,648) in view of Lee et al. (U.S. Patent No. 6,800,530).

Lee '648 discloses in FIG. 2 to 6 a method comprising: selectively forming a nitride hard mask layer 26 on a first polysilicon gate structure 10; and forming a silicide 32 on a second polysilicon gate structure 10.

Re claim 14 and 16-19, Lee '648 fails to disclose replacing the first polysilicon gate structure with a metal gate replacement.

Lee '530 suggests in FIG. 8 replacing a polysilicon gate structure 30 with a metal gate replacement 133, and removing mask 52 after forming a silicide 137.

Since Lee '648 and Lee '530 are both from the same field of endeavor, the purpose disclosed by Lee '530 would have been recognized in the pertinent prior art of Lee '648.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee '648 as suggested by Lee '530 because of the desire to form a temperature sensitive gate electrode so as to enhance device performance.

Re further claims 14 and 16-19, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed ("selectively preventing the formation of a silicide on a first polysilicon gate structure ", etc.) does not differentiate the

claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F. 2d 1647 (1987).

Conclusion

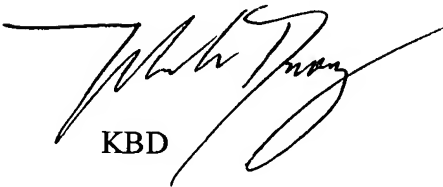
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lin '273 discloses relevant teaching regarding a metal gate structure replacement.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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